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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,457	11/28/2001	Dean Thetford	P 282717	3055

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
1714	7

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/890,457

Applicant(s)

THETFORD ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.

- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 5-7, 9-11, and 13-16 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim and cannot reference two different features. See MPEP § 608.01(n).

(a) Claims 5-7, 9-11, and 13-16 are in improper form because they depend on other multiple dependent claims. For instance, claim 5 recites a “printing ink as claimed in either claim 3 or claim 4” wherein claim 3 is also a multiple dependent claim.

(b) Claim 15 discloses a substrate printed with an “ink according to any one of claims 1 to 13” or “process according to claim 14”. Thus, claim 15 is in improper form because a multiple dependent claim cannot refer to two sets of claims to different features.

In accordance with MPEP § 608.01(n), due to the presence of improper multiple dependent claims, claims 5-7, 9-11, and 13-16 should not be further treated on the merits. However, in the interest of “compact prosecution”, claims 5-7, 9-11, and 13-16 have been treated as if they were corrected to be in proper multiple dependent form, and the rejections as set forth in following paragraphs are given.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 1 recites that the ink comprises a “substantially” non-aqueous medium. The scope of the claim is confusing because it is not clear what is meant by “substantially”. How much of the medium must be non-aqueous in order to be considered “substantially” non-aqueous. Can the medium contain water? If so, how much water can be present and the medium still considered “substantially” non-aqueous?

(b) Claim 3 recites that the dispersant is “obtainable” by reacting polyamine or polyimine with polyoxyalkylenecarbonyl acid. The scope of the claim is confusing in light of the phrase “obtainable” given that it is not clear if the dispersant is actually produced by the recited reaction or if this is just one potential process for producing the dispersant and the dispersant is actually produced by a different reaction. It is suggested that “obtainable” be changed to “obtained”.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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5. Claims 1-4 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Thetford et al. (U.S. 5,700,395).

Thetford et al. disclose non-aqueous ink comprising pigment, aromatic hydrocarbon solvent, and dispersant. The dispersant comprises a polyethyleneimine residue carrying a plurality of poly(carbonylalkyleneoxy) chains derivable from hydroxystearic acid wherein the ratio of poly(carbonylalkyleneoxy) to polyethyleneimine is 2:1 to 30:1, preferably 10:1 to 15:1. The polyethyleneimine possesses weight average molecular weight of 10,000-50,000 (col.1, lines 43-48 and 58-64, col.1, line 65-col.2, line 6, col.2, lines 13-25 and 34-36, col.3, lines 29-37, col.4, lines 12-15 and 49-52, and col.5, line 29). Given that the dispersant is prepared by reacting polyethyleneimine with hydroxystearic acid which is identical to the reaction used in the present invention, it is clear that such reaction will inherently produce dispersant of presently claimed formula (1).

It is noted that Thetford et al. disclose weight average molecular weight (M_w) of polyethyleneimine while the present claims require the number average molecular weight (M_n). However, given the relationship between M_w and M_n , i.e. $M_w/M_n \geq 1$, it is clear that the M_n of the polyethyleneimine will overlap the presently claimed M_n .

It is noted that while Thetford et al. disclose inks, there is no disclosure of drop on demand ink jet printing ink as presently claimed. On the one hand, the broad disclosure of inks by Thetford et al. clearly encompasses all inks including drop on demand ink jet printing inks. On the other hand, while there is no disclosure that the ink is a drop on demand ink jet printing ink as presently claimed, applicants attention is drawn to MPEP 2111.02 which states that "if the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and

the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction". Further, MPEP 2111.02 states that statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the purpose or intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner's position that the preamble does not state any distinct definition of any of the claimed invention's limitations and further that the purpose or intended use, i.e. drop on demand ink jet printing ink, recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art ink and further that the prior art ink is capable of performing the recited purpose or intended use.

In light of the above, it is clear that Thetford et al. anticipate the present claims.

6. Claims 1-7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by GB 2001083.

GB 2001083 discloses non-aqueous ink comprising pigment, aromatic hydrocarbon solvent, fluidizing agent, and dispersant. The dispersant is produced by reacting polyalkyleneimine such as polyethyleneimine that has molecular weight of 10,000-100,000 with polyester derived from hydroxycarboxylic acid such as hydroxystearic acid that has average molecular weight of 1600. The ratio of polyester, i.e. hydroxystearic acid, to polyethyleneimine

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is 1:1 to 10:1 (page 1, lines 7-9, 12-15, 22-24, 40-42, and 48-55, page 2, lines 6-7, 43-51, 58-60, and 62-64, page 2, line 65-page 3, line 1, page 3, lines 39-46, and example 23). Given that the dispersant is prepared by reacting polyethyleneimine with hydroxystearic acid which is identical to the reaction used in the present invention, it is clear that such reaction will inherently produce dispersant of presently claimed formula (1).

It is noted that while GB 2001083 discloses inks, there is no disclosure of drop on demand ink jet printing ink as presently claimed. On the one hand, the broad disclosure of inks by GB 2001083 clearly encompasses all inks including drop on demand ink jet printing inks. On the other hand, while there is no disclosure that the ink is a drop on demand ink jet printing ink as presently claimed, applicants attention is drawn to MPEP 2111.02 which states that "if the body of a claim fully and intrinsically sets forth all the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction". Further, MPEP 2111.02 states that statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the purpose or intended use results in a structural difference between the claimed invention and the prior art. Only if such structural difference exists, does the recitation serve to limit the claim. If the prior art structure is capable of performing the intended use, then it meets the claim.

It is the examiner's position that the preamble does not state any distinct definition of any of the claimed invention's limitations and further that the purpose or intended use, i.e. drop on demand ink jet printing ink, recited in the present claims does not result in a structural difference

between the presently claimed invention and the prior art ink and further that the prior art ink is capable of performing the recited purpose or intended use.

In light of the above, it is clear that GB 2001083 anticipates the present claims.

7. Claims 1-9 and 13-16 are rejected under 35 U.S.C. 102(a) as being anticipated by Schofield et al. (U.S. 5,837,046) taken in view of the evidence in GB 2001083.

Schofield et al. disclose non-aqueous ink jet ink for drop on demand printer which has viscosity of 6-30 MPa s and wherein the ink comprises pigment, nonaqueous medium which comprises aliphatic hydrocarbon solvent and oleyl alcohol and possesses solubility parameter of 0.1-5 MPa^{1/2}, and dispersant. The dispersant is formed by reacting polyalkyleneimine with polyester having free carboxylic groups. It is further disclosed that the ink is used to print images. Although there is no disclosure of ink jet cartridge containing the ink, it is clear that the ink jet printer would inherently possess cartridges to store ink (col.1, lines 19-31, col.2, lines 33-39, col.2, line 65-col.3, line 13, col.3, lines 26 and 59-62, and col.4, lines 19-20).

In describing the dispersant, Schofield et al. refers to GB 2001083 et al. for specific examples of the dispersant. Thus, GB 2001083 discloses dispersant produced by reacting polyalkyleneimine that has molecular weight of 10,000-100,000 with polyester derived from hydroxycarboxylic acid such as hydroxystearic acid that has average molecular weight of 1600. The ratio of polyester to polyethyleneimine is 1:1 to 10:1 (page 1, lines 7-9, 12-15, 22-24, 40-42, and 48-55, page 2, lines 6-7, 43-51, 58-60, and 62-64, page 2, line 65-page 3, line 1, page 3, lines 39-46, and example 23). Given that the dispersant is prepared by reacting polyethyleneimine

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with hydroxystearic acid which is identical to the reaction used in the present invention, it is clear that such reaction will inherently produce dispersant of presently claimed formula (1).

In light of the above, it is clear that Schofield et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thetford et al. (U.S. 5,700,395) or GB 2001083 either of which in view of Schofield et al. (U.S. 5,837,046).

The disclosures with respect to Thetford et al. and GB 2001083 in paragraphs 5 and 6, respectively, are incorporated here by reference.

The difference between Thetford et al. or GB 2001083 and the present claimed invention is the requirement in the claims of C₁₀-C₂₀ aliphatic fatty alcohol and solubility parameter of the non-aqueous medium.

Schofield et al., which is drawn to ink composition, disclose the use of non-aqueous medium which comprises oleyl alcohol in combination with aromatic or aliphatic hydrocarbon, wherein the oleyl alcohol is used to control the polar solubility parameter of the medium to 0.1-5 MPa^{1/2} in order to produce an ink with good wetting ability and compatibility (col.2, lines 65- col.3, line 13).

In light of the motivation for using aliphatic fatty alcohol disclosed by Schofield et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such alcohol in the ink of either Thetford et al. or GB 2001083 in order to produce ink with solubility parameter of 0.1-5 MPa^{1/2} which has good wetting ability and compatability, and thereby arrive at the claimed invention.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thetford et al. (U.S. 5,700,395) or Schofield et al. (U.S. 5,837,046) either of which in view of GB 2001083.

The disclosures with respect to Thetford et al. and Schofield et al. in paragraphs 5 and 7, respectively, are incorporated here by reference.

The difference between Thetford et al. or Schofield et al. and the present claimed invention is the requirement in the claims of fluidizing agent.

GB 2001083, which is drawn to ink composition, discloses the use of fluidizing agent in order that the ink possess enhanced fluidity (page 2, line 65-page 3, line 1).

In light of the motivation for using fluidizing agent disclosed by GB 2001083 as described above, it therefore would have been obvious to one of ordinary skill in the art to use fluidizing agent in the ink of either Thetford et al. or Schofield et al. in order to produce fluid ink which would be easier to handle and print, and thereby arrive at the claimed invention.

12. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thetford et al. (U.S. 5,700,395), GB 2001083, or Schofield et al. (U.S. 5,837,046) any of which in view of WO 97/15633.

The disclosures with respect to Thetford et al., GB 2001083, and Schofield et al. in paragraphs 5, 6, and 7, respectively, are incorporated here by reference.

The difference between Thetford et al., GB 2001083, or Schofield et al. and the present claimed invention is the requirement in the claims of RMV modifier.

WO 97/15633, which is drawn to ink composition, disclose the use of RMV modifier such as novolak resin in order to produce an ink with improved performance that can print for

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long periods without cleaning, replacement of nozzle plates of ink jet head, or flooding (page 3, line 18-page 5, line 3 and page 8, first full paragraph).

In light of the motivation for using RMV modifier disclosed by WO 97/15633 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such modifier in the ink of either Thetford et al., GB 2001083, or Schofield et al. in order to produce an ink that can print for long periods without cleaning, replacement of nozzle plates of ink jet head, or flooding, and thereby arrive at the claimed invention.

13. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/15633 in view of GB 2001083.

WO 97/15633 disclose non-aqueous ink jet ink for drop on demand printers which has viscosity of less than 15 mPa s and wherein the ink comprises pigment, solvent which possesses solubility parameter less than 7 MPa^{1/2} and comprises C₁₀—C₃₀ alcohol and aromatic or aliphatic hydrocarbon solvent, RMV modifier which is novolak resin, and dispersant. It is further disclosed that the ink is used to print image on substrate. Although there is no disclosure of ink jet cartridge containing the ink, it is clear that the ink jet printer would inherently possess cartridges to store ink (page 1, third full paragraph, page 3, third full paragraph to paragraph bridging pages 4-5, page 5, second full paragraph to page 7, last paragraph, page 8, first full paragraph, page 17, lines 1-3, and claim 9).

The difference between WO 97/15633 and the present claimed invention is the requirement in the claims of (a) specific type of dispersant and (b) fluidizing agent.

With respect to difference (a), GB 2001083, which is drawn to ink composition, discloses dispersant produced by reacting polyalkyleneimine which has molecular weight of 10,000-100,000 with polyester derived from hydroxycarboxylic acid such as hydroxystearic acid which has average molecular weight of 1600. The ratio of polyester, i.e. hydroxystearic acid, to polyethyleneimine is 1:1 to 10:1 (page 1, lines 7-9, 12-15, 22-24, 40-42, and 48-55, page 2, lines 6-7, 43-51, 58-60, and 62-64, page 2, line 65-page 3, line 1, page 3, lines 39-46, and example 23). Given that the dispersant is prepared by reacting polyethyleneimine with hydroxystearic acid which is identical to the reaction used in the present invention, it is clear that such reaction will inherently produce dispersant of presently claimed formula (1).

The motivation for using such dispersant is that the dispersant effectively deflocculates the pigment and produces a fluid ink composition that is easier to handle (page 2, lines 55-61 and page 4, lines 46-48).

In light of the motivation for using specific type of dispersant disclosed by GB 2001083 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such dispersant in the ink of WO 97/15633, and thereby arrive at the claimed invention.

With respect to difference (b), GB 2001083, which is drawn to ink composition, discloses the use of fluidizing agent in order that the ink possess enhanced fluidity (page 2, line 65-page 3, line 1).

In light of the motivation for using fluidizing agent disclosed by GB 2001083 as described above, it therefore would have been obvious to one of ordinary skill in the art to use fluidizing agent in the ink of WO 97/15633 in order to produce fluid ink which would be easier to handle and print, and thereby arrive at the claimed invention.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Griffin et al. (U.S. 5,843,219) disclose ink comprising hydrocarbon solvent and polyesteramine dispersant.

WO 96/14344 discloses pigment formulation for paint which comprises dispersant as presently claimed.

JP 62004433 discloses non-aqueous ink comprising dispersant produced by reacting polyoctamethylene polyamine and polyester formed from hydroxystearic acid, however, there is no disclosure of the number average molecular weight of the polyamine or that the ink is a drop on demand ink.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

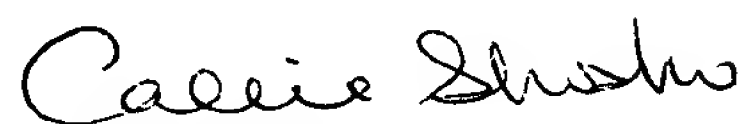
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho

Examiner

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February 10, 2003